

## **REMARKS**

In the Office Action,<sup>1</sup> the Examiner :

- (a) objected to claims 7, 17, and 21 because of informalities;
- (b) rejected claims 1-5, 8-14, 16, 18-19, and 21 under 35 U.S.C. § 102(e) as being unpatentable over Hafeez et al. (U.S. Patent No. 6,920,191) ("Hafeez"); and
- (c) rejected claims 6-7, 15, 17, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Hafeez in view of Shattil (U.S. Patent Publication No. 2002/0034191) ("Shattil").

Applicants amend claims 4, 5, 7, 13, 14, 17, 18, and 20 to improve form and clarity. Applicants incorporate the features of claim 21 into independent claim 9 and hence dependent claims 10-17 followed by canceling claim 21. Upon entry of this Amendment, claims 1-20 will remain pending in this application. Applicants respectfully traverse the rejections for the following reasons.

### **Objection of Claims 7, 17, and 21 because of informalities:**

The Examiner objected to claims 7, 17, and 21 because of informalities. In particular, the Examiner stated "please change 'at least two' to –at least one–" in claims 7 and 17, and "please change 'an approximation of the non-channel function' to –the approximation of the non-channel function–" in claim 21 (Office Action, p. 2).

In response, Applicants amend claims 7 and 17. Claims 7 and 17 now recite, *inter alia*, "applying at least one equalization." Thus, Applicants deem the objection overcome. With respect to claim 21, Applicants incorporate the features of claim 21 into

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<sup>1</sup> The Office Action may contain statements characterizing the related art, case law, and claims. Regardless of whether any such statements are specifically identified herein, Applicants decline to automatically subscribe to any statements in the Office Action.

independent claim 9 and, hence, dependent claims 10-17, followed by canceling claim 21.

**Rejection of Claims 1-5, 8-14, 16, 18-19, and 21 under 35 U.S.C. § 102(e):**

Applicants traverse the rejection of claims 1-5, 8-14, 16, 18-19, and 21 under 35 U.S.C. § 102(e) as being anticipated by Hafeez. Applicants respectfully disagree with the Examiner's arguments and conclusions.

In order to properly establish anticipation under 35 U.S.C. § 102, the Federal Circuit has held that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Furthermore, “[t]he identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). See also M.P.E.P. § 2131.

Hafeez does not disclose each and every element recited in the claims, despite the Examiner's allegations. Particularly, Hafeez does not disclose at least Applicants' claimed “obtaining an approximation of the pulse shaping distortion” as recited in claim 1 (emphasis added).

The Examiner alleged that Hafeez teaches “obtaining an approximation of the pulse shaping distortion (112 in Fig. 3)” (Office Action, p. 3). However, this is not correct.

Hafeez discloses that “[a]n impulse response is a mathematical function that describes the output waveform that results when the input is excited by a unit impulse

function" (col. 1, lines 28-30). Hafeez further discloses that "[a]dditionally, pulse-shape estimator 112 calculates the impulse response of the receive filter 106 as described in reference to FIG. 1" (col. 8, lines 22-24, emphasis added). In particular, Hafeez teaches that "[i]n general, by comparing the sampled received signal  $y(n)$ , which corresponds to the training symbols after transmission and processing by downconverter 104 and receive filter 106, to the expected pre-stored training symbols 113, pulse-shape estimator 112 estimates the pulse-shape response of the receive filter 106 (col. 3, lines 23-29, emphasis added). Hafeez therefore fails to teach "obtaining an approximation of the pulse shaping distortion" as recited in claim 1 (emphasis added).

With respect to claim 9, Applicants incorporate the features of dependent claim 21 into independent claim 9. Claim 9 now recites "[a] signal processing method comprising . . . obtaining an approximation of the non-channel distortion" (emphasis added). The Examiner alleged that Hafeez teaches "obtaining an approximation of the non-channel function (112 in Fig. 3)" (Office Action, p. 4). However, similar to the discussion above in connection with claim 1, Hafeez does not teach "obtaining an approximation of the non-channel distortion" as recited in claim 9 (emphasis added).

The Examiner also alleged that "[r]egarding to claim 21, Hafeez et al disclose wherein an approximation of the non-channel function comprises an approximation of the non-channel distortion (abstract and Col 8, L12-14)" (Office Action, p. 5, emphasis added). However, this is not correct.

Hafeez discloses that "due to manufacturing and component variability, the pulse-shape response may not perfectly match the intended pulse-shape response. . . . Distortion in the pulse-shape response may cause inter-symbol interference (ISI)

and/or adjacent channel interference (ACI)" (col.1, lines 52-59, emphasis added).

Hafeez further discloses that "[t]he pulse-shape response estimate can also be used to compensate for pulse-shape distortion due to manufacturing defects or other variations in analog receive filters" (col. 8, lines 12-14, emphasis added). However, this does not constitute a teaching of "non-channel distortion", as recited in claim 9.

Applicants' specification states: "[t]he first term is the original spreading code of the  $n^{\text{th}}$  symbol of  $i^{\text{th}}$  user . . . [and the second term]  $\Delta_i(jn)$  is the small fixed PS distortion to the spreading code due to the pulse shaping, as shown in Figure 1" (p.9, par. [029]) and "[w]ith the PS function distortion subtracted from received signal  $r(t)$ ,  $r'(t)$  has no PS effects" (p.10, par. [030], emphasis added). As specified in the M.P.E.P., "[d]uring patent examination, the pending claims must be 'given their broadest reasonable interpretation consistent with the specification.'" (M.P.E.P. § 2111, 8th Ed., Rev. 5 (August 2006), emphasis added). Accordingly, the "pulse-shape distortion" of Hafeez, which is the "[d]istortion in the pulse-shape response" and is due to "manufacturing and component variability", does not constitute the claimed "non-channel distortion", which is the distortion in the received signal and is "produced by a non-channel function", or the claimed "pulse shaping distortion", which is the distortion in the received signal and is "produced by pulse shaping" (emphasis added). Hafeez therefore fails to teach or suggest each and every element recited in claim 9.

Hafeez also fails to teach or suggest each and every element recited in claim 18. Claim 18 recites "an approximating device, coupled to the tracking device, for providing an approximation of distortion produced by a non-channel function in the first signal" (emphasis added). The Examiner alleged that Hafeez teaches "an approximating

device, coupled to the tracking device, for providing an approximation of a non-channel function in the first signal (112 in Fig. 3)" (Office Action, p. 5). However, similar to the discussion above in connection with claims 1 and 9, Hafeez does not teach "an approximating device . . . providing an approximation of distortion produced by a non-channel function in the first signal" as recited in claim 18 (emphasis added).

For at least this reason, Hafeez does not anticipate independent claims 1, 9, and 18. Independent claims 1, 9, and 18 are allowable, and dependent claims 2-5, 8, 10-14, 16, and 19 are also allowable at least by virtue of their dependence from one of allowable base claims 1, 9, and 18. The 35 U.S.C. § 102(e) rejection is therefore improper and should be withdrawn.

**Rejection of Claims 6-7, 15, 17, and 20 under 35 U.S.C. § 103(a):**

Applicants traverse the rejection of claims 6-7, 15, 17, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Hafeez in view of Shattil. A *prima facie* case of obviousness has not been established. As M.P.E.P. § 2142 states, "[t]he examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness."

To establish a *prima facie* case of obviousness, the prior art (taken separately or in combination) must teach or suggest all the claim limitations. See M.P.E.P. § 2142, 8th Ed., Rev. 5 (August 2006). Moreover, "in formulating a rejection under 35 U.S.C. § 103(a) based upon a combination of prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed." USPTO Memorandum from Margaret A. Focarino, Deputy Commissioner for Patent Operations, May 3, 2007, page 2.

Claims 6 and 7 depend upon base claim 1, claims 15 and 17 depend upon base claim 9, and claim 20 depends upon base claim 18. As explained above, Hafeez teaches neither “obtaining an approximation of the pulse shaping distortion” as recited in claim 1 and required by dependent claims 6 and 7, nor “obtaining an approximation of the non-channel distortion” as recited in claim 9 and required by dependent claims 15 and 17, nor “an approximating device, coupled to the tracking device, for providing an approximation of distortion produced by a non-channel function in the first signal” as recited in claim 18 and required by dependent claim 20.

Shattil fails to cure Hafeez’s deficiencies. The Examiner alleged that “Shattil discloses a wireless communication system comprise[s] an approximate solution that is obtained from a first-order perturbation calculation ([0678])” (Office Action, p.6). However, even if this allegation is correct, Shattil teaches neither “obtaining an approximation of the pulse shaping distortion” as recited in base claim 1 and required by dependent claims 6 and 7, nor “obtaining an approximation of the non-channel distortion” as recited in base claim 9 and required by dependent claims 15 and 17, nor “an approximating device, coupled to the tracking device, for providing an approximation of distortion produced by a non-channel function in the first signal” as recited in base claim 18 and required by dependent claim 20.

For at least the foregoing reasons, neither Hafeez nor Shattil, nor any combination thereof, teaches or suggests each and every feature of claims 6-7, 15, 17, and 20. For at least this reason, no *prima facie* case of obviousness has been established. Accordingly, the § 103(a) rejection of those claims should be withdrawn.

**Conclusion:**

In view of the foregoing, Applicants request reconsideration of the application and withdrawal of the rejection. Pending claims 1-20 are in condition for allowance, and Applicants request a favorable action.

If there are any remaining issues or misunderstandings, Applicants request the Examiner telephone the undersigned representative to discuss them.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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